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Innovative installation method using water as a carrying fluid to install power cables in pre-lubricated ducts in trenches of reduced dimensions

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Abstract:

This method consists in using pre-lubricated PE ducts in which frictions are considerably diminished, in injecting pressurized water into the duct to carry the cable forward, thus avoiding the sticking effect due to the electrostatic field, and reduce friction heating, in pushing the cable with caterpillars and pulling it with a shuttle-head or, depending on the cable type, in letting the cable being pushed by the drag of the water flow.

Advantages of this method:

- Cable placing does not depend on the duct building activities: reduced site neighborhood disturbance
- Greater cable lengths between splices or manholes
- Almost no efforts exerted on the cables: greatly reduced installation risks
- Possibility to follow much more complex routes

Keywords: Floating; pre-lubricated ducts; crushing; mobile site

Review: pulling method**Characteristics of the method:**

Presently, electric power cables are pulled into dry ducts, which are lubricated as the cables are being installed. This method presents following inconveniences:

- a) integrity of the cable sheath:
During pulling operations the cable sheaths are subject to severe damages, to such an extent, that some companies have been looking for a device enabling them to check the quality of the thus installed cable on site.
- b) integrity of the duct:
During operation the pulling line can cut into

Résumé:

Cette méthode consiste à utiliser des conduits pré-lubrifiés en PE pour abaisser les frottements, à injecter sous pression de l'eau dans la conduite pour porter le câble, annulant ainsi l'effet de collage dû au champ électrostatique et limitant les échauffements par friction, à pousser le câble par des chenilles et à le tirer au moyen d'une tête faisant furet ou, selon le type de câble par la traînée provoquée le flux d'eau.

Avantages de la méthode :

- Insertion des câbles indépendante du génie civil des conduites : impact réduit des chantiers sur le voisinage.
- Plus grandes longueurs de câbles sans jonction ni chambre
- Pratiquement plus d'efforts sur les câbles risque d'installation considérablement réduit
- Possibilité de parcours beaucoup plus complexes.

Mots clés: Flottage; tube pré-lubrifié; broyage; chantier mobile

the duct walls over bends, sometimes cutting right through the walls.

- c) installation setup:
The forces encountered with this method, often require line-pulls of several tons applied at the head of the cable and exerting mechanical stresses on it, and the use of powerful, cumbersome and costly means.
- d) installation lengths:
Installation lengths depend on the sinuosity of the route and this in all directions. The pulling method, where the traction force is exerted at the cable extremity, is particularly penalizing. Indeed, the pulling force grows exponentially as the cable passes over bends. It can rapidly